REMARKS

Claims 1-6 and 28-38 are pending. Claims 1-6 are under examination.

Rejections Under 35 U.S.C. § 103

The rejection of claims 1, 2, 4, and 6 under 35 U.S.C. § 103 as allegedly obvious over Soane et al. (U.S. Patent No. 6,413,400 B1) ("Soane"), *Modern Plastics Encyclopedia '99*, W. Kaplan (ed.), McGraw-Hill, New York, 1998, Appendix C ("Encyclopedia"), *Plastics Design Handbook*, Rosato et al., Kluwwer Academic Publishers 2001, pp. 309-334 and 400-412 ("Handbook") and Jons et al. (U.S. Patent No. 5,783,452) ("Jons") is respectfully traversed. Applicant respectfully submits that the claimed devices are unobvious over Soane, alone or in combination with Encyclopedia, Handbook and/or Jons.

As stated by the Examiner, all materials are endowed with certain degrees of optical, mechanical, physical, and chemical properties. However, Applicant respectfully disagrees with the assertion in the Office Action that the choice of one polycarbonate over another is just a matter of optimizing the device for the sample, buffer, and detection method. The different properties of a material dictate whether the material can be used for a given purpose or not. Rubbers have applications that they are best suited for, epoxies have different strengths and applications, thermoplastics (like polycarbonate) have their uses, and thermoset resins have their advantages. The fact that polyol (allyl carbonate) polymers as thermoset crystalline polymers are endowed with properties especially suited for the electrokinetic devices is an unexpected and surprising result when compared to the performance of polycarbonate thermoplastics that are amorphous in nature that make-up the prior art. Polycarbonates as described by Soane are of a completely different class of polymer than polyol (allyl carbonate) polymers and the use of thermoplastics as described by Soane in no way teaches or suggests that the use of a different class of polymer will overcome the multitude of limitations presented by the use of polycarbonate thermoplastics. It is the unique properties of the polyol (allyl carbonate) polymers, as described in the present application, that allows the development of the claimed devices that do not dissolve in non-aqueous solvents, that do not melt under high applied electrical fields, and do not short under high electrical fields as would be the case with thermoplastics such as polycarbonates.

Applicant respectfully submits that none of Encyclopedia, Handbook and/or Jons cures the deficiencies of Soane. In particular in Jons, the construction of covered microchannels makes use of a substrate layer, an etchable layer, and a cover. Among the "grocery list" of materials listed in this patent as being suitable for the substrate layer, diglycol dialkyl carbonate is mentioned. Jons failed to identify any physical or chemical characteristic as being more or less desirable in this underlying support material; indeed, the variety of organic and inorganic materials listed in Jons is presented with complete disregard to any specific characteristic. For this reason, Jons provides substantial evidence that those skilled in the art failed to recognize the advantages provided specifically by diglycol dialkyl carbonate. Jons does not teach or suggest that specific chemical and physical properties of diglycol dialkyl carbonate or polyol (allyl carbonate) polymers would confer the ability to develop electrokinetic devices superior in performance and characteristics over thermoplastics.

Addressing claim 4, "pre-polymer" is generally understood by those skilled in the art as being a stable formulation of a resin or polymer where a substantial number of monomers have polymerized into short chains but having the polymerization process truncated before there is a substantial change in viscosity. With respect to the Examiner's comment that "a polymer is inherently generated by polymerizing a prepolymer of the polymer," Applicant points out that there are distinct differences in the processes of polymerization and the product of polymerization depending upon the input in the chemical reaction. If monomers are fed into the polymerization reaction, then chains will grow in length as well as in crystalline properties. The product of these reactions will cross a threshold of physical characteristics beyond which the crystal lattice is set. Unlike amorphous thermoplastic polycarbonates, the crystal structure of thermoset resins cannot be morphed into different conformations by application of heat. In contrast, when stable formulations with extended shelf-life of short chains of monomer that have largely the same liquid flow characteristics as the monomer solution, that is prepolymers, are used to form the final molded product, advantages such as reduced shrinkage and reduced breakage during the molding process are realized.

Addressing claim 6, Soane col. 08:62 - col. 09:02 referenced by the Examiner describes the presence of antigens or antibodies within a reservoir, a process unrelated to the modification of chemical properties of the polyol (allyl carbonate) polymer by attachment of a ligand as

recited in claim 6. Here, one ordinarily skilled in the art would understand that the attachment of a ligand refers to a chemical transformation that attaches a new chemical functionality to the polymer. The embodiment recited in this claim is one of the key advantages of polyol (allyl carbonate) polymers in making electrokinetic devices, which provides the ability to change the chemical properties of different regions on the device as a result of the unique chemical properties of the polymer and the ability to use organic solvents during these chemical transformations.

Applicant respectfully submits that the claimed devices are unobvious over Soane, alone or in combination with Encyclopedia, Handbook and/or Jons. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

The rejection of claims 1, 2, and 4 under 35 U.S.C. § 103(a) as allegedly obvious over Liu et al. ("Microfabricated Polycarbonate CE Devices for DNA Analysis," Anal. Chem. 73:4196-4201 (2001) ("Liu"), *Modern Plastics Encyclopedia '99*, W. Kaplan (ed.), McGraw-Hill, New York, 1998, Appendix C ("Encyclopedia"), *Plastics Design Handbook*, Rosato et al., Kluwwer Academic Publishers 2001, pp. 309-334 and 400-412 ("Handbook") and Jons et al. (U.S. Patent No. 5,783,452) ("Jons") is respectfully traversed. Applicant respectfully submits that the claimed devices are unobvious over Liu, alone or in combination with Encyclopedia, Handbook and/or Jons.

As discussed above, all materials are endowed with certain degrees of optical, mechanical, physical, and chemical properties. However, Applicant respectfully disagrees with the assertion in the Office Action that the choice of one polycarbonate over another is just a matter of optimizing the device for the sample, buffer, and detection method. As discussed above, the different properties of a material dictate whether the material can be used for a given purpose or not. Rubbers have applications that they are best suited for, epoxies have different strengths and applications, thermoplastics (like polycarbonate) have their strengths, and thermoset resins have their advantages. The fact that polyol (allyl carbonate) polymers as thermoset crystalline polymers are endowed with properties especially suited for the electrokinetic devices is an unexpected and surprising result when compared to the performance of polycarbonate thermoplastics that are amorphous in nature. Polycarbonates as described by

Liu are of a completely different class of polymer than polyol (allyl carbonate) polymers and the use of thermoplastics as described by Liu in no way teaches or suggests that the use of a different class of polymer will overcome the multitude of limitations presented by the use of polycarbonate thermoplastics. It is the unique properties of the polyol (allyl carbonate) polymers, as described in the present application, that allows the development of the claimed devices that do not dissolve in non-aqueous solvents, that do not melt under high applied electrical fields, and do no short under high electrical fields as would be the case with thermoplastics such as polycarbonates.

Furthermore, as discussed above, in Jons, the construction of covered microchannels makes use of a substrate layer, an etchable layer, and a cover. Among the "grocery list" of materials listed in this patent as being suitable for the substrate layer, diglycol dialkyl carbonate is mentioned. Jons failed to identify any physical or chemical characteristic as being more or less desirable in this underlying support material; indeed, the variety of organic and inorganic materials listed in Jons is presented with complete disregard to any specific characteristic. For this reason, Jons provides substantial evidence that those skilled in the art failed to recognize the advantages provided specifically by diglycol dialkyl carbonate. Jons does not teach or suggest that specific chemical and physical properties of diglycol dialkyl carbonate or polyol (allyl carbonate) polymers would confer the ability to develop electrokinetic devices superior in performance and characteristics over thermoplastics.

Addressing claim 4, "pre-polymer" is generally understood by those skilled in the art as being a stable formulation of a resin or polymer where a substantial number of monomers have polymerized into short chains but having the polymerization process truncated before there is a substantial change in viscosity. With respect to the Examiner's comment that "a polymer is inherently generated by polymerizing a prepolymer of the polymer," Applicant points out that there are distinct differences in the processes of polymerization and the product of polymerization depending upon the input in the chemical reaction. If monomers are fed into the polymerization reaction, then chains will grow in length as well as in crystalline properties. The product of these reactions will cross a threshold of physical characteristics beyond which the crystal lattice is set. Unlike amorphous thermoplastic polycarbonates, the crystal structure of thermoset resins cannot be morphed into different conformations by application of heat. In

contrast, when stable formulations with extended shelf-life of short chains of monomer that have largely the same liquid flow characteristics as the monomer solution, that is prepolymers, are used to form the final molded product, advantages such as reduced shrinkage and reduced breakage during the molding process are realized.

Applicant respectfully submits that the claimed devices are unobvious over Liu, alone or in combination with Encyclopedia, Handbook and/or Jons. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

The rejection of claim 3 under 35 U.S.C. § 103(a) as allegedly obvious over Jons et al. (U.S. Patent No. 5,783,452) ("Jons") in view of *Modern Plastics Encyclopedia '99*, W. Kaplan (ed.), McGraw-Hill, New York, 1998, Appendix C ("Encyclopedia"), *Plastics Design Handbook*, Rosato et al., Kluwwer Academic Publishers 2001, pp. 309-334 and 400-412 ("Handbook") and *Concise Encyclopedia of Plastics*, Springer-Verlag, 2000, p. 93 ("Concise Encyclopedia") is respectfully traversed. Applicant respectfully submits that the claimed device is unobvious over Jons, alone or in combination with Encyclopedia, Handbook and/or Concise Encyclopedia.

As discussed above, in Jons, the construction of covered microchannels makes use of a substrate layer, an etchable layer, and a cover. Among the "grocery list" of materials listed in this patent as being suitable for the substrate layer, diglycol dialkyl carbonate is mentioned. Jons failed to identify any physical or chemical characteristic as being more or less desirable in this underlying support material; indeed, the variety of organic and inorganic materials listed in Jons is presented with complete disregard to any specific characteristic. For this reason, Jons provides substantial evidence that those skilled in the art failed to recognize the advantages provided specifically by diglycol dialkyl carbonate. Jons does not teach or suggest that specific chemical and physical properties of diglycol dialkyl carbonate or polyol (allyl carbonate) polymers would confer the ability to develop electrokinetic devices superior in performance and characteristics over thermoplastics.

Applicant respectfully submits that none of Encyclopedia, Handbook and/or Concise Encyclopedia cures the deficiencies of Jons. There are several different classes of polymers—each having strengths and weaknesses for different applications. Just considering some

exemplary clear polymers, the material could be inorganic like glass or aluminum hydroxide or organic like albumin or algin or polycarbonate or a polyol (allyl carbonate). Equating these different classes merely as polymers possessed of varying degrees of chemical and physical properties is not relevant to the claimed devices any more than the substitution of polycarbonate for polyol (allyl carbonate) would have over substituting polycarbonate for algin. Polyol (allyl carbonate) polymers are semi-crystalline to crystalline thermoset resins. As a result, these polymers are possessed with chemical resistance, optical clarity, moldability (through a process different from thermoplastics like polycarbonate), electrical properties, and heat resistance that make them superior to other materials for electrokinetic devices, as disclosed in the present application. Applicant respectfully submits that, prior to the teaching in the present application, it was not obvious that polyol (allyl carbonate) polymers would have unsurpassed performance in electrokinetic devices nor was it an obvious extension from polycarbonates to appreciate that a thermoset resin would provide the route toward a non-glass electrokinetic device.

The Examiner correctly cited the long history of diethylene glycol bis (allyl carbonate) with its initial development taking place in the 1940s. This long history and the failure to recognize this material as having substantial chemical and physical properties ideally suited for electrokinetic devices substantiates Applicant's position that the claimed devices using polyol (allyl carbonate) polymer were unobvious prior to the teaching of the present application.

Applicant respectfully submits that the claimed device is unobvious over Jons, alone or in combination with Encyclopedia, Handbook and/or Concise Encyclopedia. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

The rejection of claims 1, 2, and 4 under 35 U.S.C. § 103(a) as allegedly obvious over Webster et al. ("Batch Fabricated Electrophoresis Chips on Polycarbonate Substrates by Surface Micromachining," J. Capillary Electrophoresis and Microchip Technology 6 (1&2):19-25 (1999) ("Webster"), *Modern Plastics Encyclopedia '99*, W. Kaplan (ed.), McGraw-Hill, New York, 1998, Appendix C ("Encyclopedia"), *Plastics Design Handbook*, Rosato et al., Kluwwer Academic Publishers 2001, pp. 309-334 and 400-412 ("Handbook") and Jons et al. (U.S. Patent No. 5,783,452) ("Jons") is respectfully traversed. Applicant respectfully submits that the

claimed devices are unobvious over Webster, alone or in combination with Encyclopedia, Handbook and/or Jons.

As discussed above, all materials are endowed with certain degrees of optical, mechanical, physical, and chemical properties. However, Applicant respectfully disagrees with the assertion in the Office Action that the choice of one polycarbonate over another is just a matter of optimizing the device for the sample, buffer, and detection method. As discussed above, the different properties of a material dictate whether the material can be used for a given purpose or not. Rubbers have applications that they are best suited for, epoxies have different strengths and applications, thermoplastics (like polycarbonate) have their strengths, and thermoset resins have their advantages. The fact that polyol (allyl carbonate) polymers as thermoset crystalline polymers are endowed with properties especially suited for the electrokinetic devices is an unexpected and surprising result when compared to the performance of polycarbonate thermoplastics that are amorphous in nature. Polycarbonates as described by Webster are of a completely different class of polymer than polyol (allyl carbonate) polymers and the use of thermoplastics as described by Webster in no way teaches or suggests that the use of a different class of polymer will overcome the multitude of limitations presented by the use of polycarbonate thermoplastics. It is the unique properties of the polyol (allyl carbonate) polymers, as described in the present application, that allows the development of the claimed devices that do not dissolve in non-aqueous solvents, that do not melt under high applied electrical fields, and do no short under high electrical fields as would be the case with thermoplastics such as polycarbonates.

Furthermore, none of Encyclopedia, Handbook and/or Jons cures the deficiencies of Webster. As discussed above, in Jons, the construction of covered microchannels makes use of a substrate layer, an etchable layer, and a cover. Among the "grocery list" of materials listed in this patent as being suitable for the substrate layer, diglycol dialkyl carbonate is mentioned. Jons failed to identify any physical or chemical characteristic as being more or less desirable in this underlying support material; indeed, the variety of organic and inorganic materials listed in Jons is presented with complete disregard to any specific characteristic. For this reason, Jons provides substantial evidence that those skilled in the art failed to recognize the advantages provided specifically by diglycol dialkyl carbonate. Jons does not teach or suggest that specific chemical

and physical properties of diglycol dialkyl carbonate or polyol (allyl carbonate) polymers would confer the ability to develop electrokinetic devices superior in performance and characteristics over thermoplastics.

Addressing claim 4, "pre-polymer" is generally understood by those skilled in the art as being a stable formulation of a resin or polymer where a substantial number of monomers have polymerized into short chains but having the polymerization process truncated before there is a substantial change in viscosity. With respect to the Examiner's comment that "a polymer is inherently generated by polymerizing a prepolymer of the polymer," Applicant points out that there are distinct differences in the processes of polymerization and the product of polymerization depending upon the input in the chemical reaction. If monomers are fed into the polymerization reaction, then chains will grow in length as well as in crystalline properties. The product of these reactions will cross a threshold of physical characteristics beyond which the crystal lattice is set. Unlike amorphous thermoplastic polycarbonates, the crystal structure of thermoset resins cannot be morphed into different conformations by application of heat. In contrast, when stable formulations with extended shelf-life of short chains of monomer that have largely the same liquid flow characteristics as the monomer solution, that is prepolymers, are used to form the final molded product, advantages such as reduced shrinkage and reduced breakage during the molding process are realized.

Applicant respectfully submits that the claimed devices are unobvious over Webster, alone or in combination with Encyclopedia, Handbook and/or Jons. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

The rejection of claim 5 under 35 U.S.C. § 103(a) as allegedly obvious over Soane et al. (U.S. Patent No. 6,413,400 B1), *Modern Plastics Encyclopedia '99*, W. Kaplan (ed.), McGraw-Hill, New York, 1998, Appendix C ("Encyclopedia"), *Plastics Design Handbook*, Rosato et al., Kluwwer Academic Publishers 2001, pp. 309-334 and 400-412 ("Handbook") and Jons et al. (U.S. Patent No. 5,783,452) ("Jons") as applied to claims 1, 2, 4 and 6, above in view of Singh et al. (U.S. Patent No. 6,627,406 B1) ("Singh") or Wainwright et al. (U.S. Patent No. 6,306,273 B1) ("Wainwright"), is respectfully traversed. Applicant respectfully submits that the claimed

device is unobvious over Soane, alone or in combination with Encyclopedia, Handbook, Jons, Singh and/or Wainwright.

As discussed above, all materials are endowed with certain degrees of optical, mechanical, physical, and chemical properties. However, Applicant respectfully disagrees with the assertion in the Office Action that the choice of one polycarbonate over another is just a matter of optimizing the device for the sample, buffer, and detection method. The different properties of a material dictate whether the material can be used for a given purpose or not. Rubbers have applications that they are best suited for, epoxies have different strengths and applications, thermoplastics (like polycarbonate) have their strengths, and thermoset resins have their advantages. The fact that polyol (allyl carbonate) polymers as thermoset crystalline polymers are endowed with properties especially suited for the electrokinetic devices is an unexpected and surprising result when compared to the performance of polycarbonate thermoplastics that are amorphous in nature. Polycarbonates as described by Soane are of a completely different class of polymer than polyol (allyl carbonate) polymers and the use of thermoplastics as described by Soane in no way teaches or suggests that the use of a different class of polymer will overcome the multitude of limitations presented by the use of polycarbonate thermoplastics. It is the unique properties of the polyol (allyl carbonate) polymers, as described in the present application, that allows the development of the claimed devices that do not dissolve in non-aqueous solvents, that do not melt under high applied electrical fields, and do no short under high electrical fields as would be the case with thermoplastics such as polycarbonates.

Applicant respectfully submits that none of Encyclopedia, Handbook, Jons, Singh and/or Wainright cures the deficiencies of Soane. The surface modification of electrokinetic channels has been an area of active research since the discovery of capillary electrophoresis. References to these methods abound in the literature as well as in Singh and Wainwright. However, claim 5 recites that the chemical properties of the polyol (allyl carbonate) polymer are modified by hydrolysis. Unlike polycarbonate and polyacrylate treated with NaOH described in Singh and Wainwright, polyol (allyl carbonate) polymers do not loose mechanical properties upon treatment with strong bases. The big difference among these polymers, as described in the present application, lies in the chemical resistance that is inherent to polyol (allyl carbonate)

polymers and is limited in polyacrylates and polycarbonates. As a result, the chemical attachment of ligands to the surface of polyol (allyl carbonate) polymers opens a large repertoire of chemical reactions that would be impossible with other polymers. The fact that these transformations could be performed with a polymer is a unique and differentiating characteristic of the polyol (allyl carbonate) polymers.

Applicant respectfully submits that the claimed device is unobvious over Soane, alone or in combination with Encyclopedia, Handbook, Jons, Singh and/or Wainright. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

The rejection of claim 5 under 35 U.S.C. § 103(a) as allegedly obvious over Liu et al. ("Microfabricated Polycarbonate CE Devices for DNA Analysis," Anal. Chem. 73:4196-4201 (2001) ("Liu"), *Modern Plastics Encyclopedia '99*, W. Kaplan (ed.), McGraw-Hill, New York, 1998, Appendix C ("Encyclopedia"), *Plastics Design Handbook*, Rosato et al., Kluwwer Academic Publishers 2001, pp. 309-334 and 400-412 ("Handbook") and Jons et al. (U.S. Patent No. 5,783,452) ("Jons") as applied to claims 1, 2, and 4, above in view of Singh et al. (U.S. Patent No. 6,627,406 B1) ("Singh") or Wainwright et al. (U.S. Patent No. 6,306,273 B1) ("Wainwright"), is respectfully traversed. Applicant respectfully submits that the claimed device is unobvious over Liu, alone or in combination with Encyclopedia, Handbook, Jons, Singh and/or Wainright.

As discussed above, all materials are endowed with certain degrees of optical, mechanical, physical, and chemical properties. However, Applicant respectfully disagrees with the assertion in the Office Action that the choice of one polycarbonate over another is just a matter of optimizing the device for the sample, buffer, and detection method. The different properties of a material dictate whether the material can be used for a given purpose or not. Rubbers have applications that they are best suited for, epoxies have different strengths and applications, thermoplastics (like polycarbonate) have their strengths, and thermoset resins have their advantages. The fact that polyol (allyl carbonate) polymers as thermoset crystalline polymers are endowed with properties especially suited for the electrokinetic devices is an unexpected and surprising result when compared to the performance of polycarbonate thermoplastics that are amorphous in nature. Polycarbonates as described by Liu are of a

completely different class of polymer than polyol (allyl carbonate) polymers and the use of thermoplastics as described by Liu in no way teaches or suggests that the use of a different class of polymer will overcome the multitude of limitations presented by the use of polycarbonate thermoplastics. It is the unique properties of the polyol (allyl carbonate) polymers, as described in the present application, that allows the development of the claimed devices that do not dissolve in non-aqueous solvents, that do not melt under high applied electrical fields, and do no short under high electrical fields as would be the case with thermoplastics such as polycarbonates.

None of Encyclopedia, Handbook, Jons, Singh and/or Wainright cures the deficiencies of Liu. As discussed above, the surface modification of electrokinetic channels has been an area of active research since the discovery of capillary electrophoresis. References to these methods abound in the literature as well as in Singh and Wainwright. However, claim 5 recites that the chemical properties of the polyol (allyl carbonate) polymer are modified by hydrolysis. Unlike polycarbonate and polyacrylate treated with NaOH, polyol (allyl carbonate) polymers do not loose mechanical properties upon treatment with strong bases. The big difference among these polymers, as described in the present application, lies in the chemical resistance that is inherent to polyol (allyl carbonate) polymers and is limited in polyacrylates and polycarbonates. As a result, the chemical attachment of ligands to the surface of polyol (allyl carbonate) polymers opens a large repertoire of chemical reactions that would be impossible with other polymers.

Applicant respectfully submits that the claimed device is unobvious over Liu, alone or in combination with Encyclopedia, Handbook, Jons, Singh and/or Wainright. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

The rejection of claim 5 under 35 U.S.C. § 103(a) as allegedly obvious over Jons et al. (U.S. Patent No. 5,783,452) ("Jons"), *Modern Plastics Encyclopedia '99*, W. Kaplan (ed.), McGraw-Hill, New York, 1998, Appendix C ("Encyclopedia"), *Plastics Design Handbook*, Rosato et al., Kluwwer Academic Publishers 2001, pp. 309-334 and 400-412 ("Handbook") and Jons et al. (U.S. Patent No. 5,783,452) ("Jons") as applied to claims 1, 2, and 4, above in view of Singh et al. (U.S. Patent No. 6,627,406 B1) ("Singh") or Wainwright et al. (U.S. Patent No. 6,306,273 B1) ("Wainwright"), is respectfully traversed. Applicant respectfully submits that the

claimed device is unobvious over Jons, alone or in combination with Encyclopedia, Handbook, Singh and/or Wainright.

As discussed above, in Jons, the construction of covered microchannels makes use of a substrate layer, an etchable layer, and a cover. Among the "grocery list" of materials listed in this patent as being suitable for the substrate layer, diglycol dialkyl carbonate is mentioned. Jons failed to identify any physical or chemical characteristic as being more or less desirable in this underlying support material; indeed, the variety of organic and inorganic materials listed in Jons is presented with complete disregard to any specific characteristic. For this reason, Jons provides substantial evidence that those skilled in the art failed to recognize the advantages provided specifically by diglycol dialkyl carbonate. Jons does not teach or suggest that specific chemical and physical properties of diglycol dialkyl carbonate or polyol (allyl carbonate) polymers would confer the ability to develop electrokinetic devices superior in performance and characteristics over thermoplastics.

None of Encyclopedia, Handbook, Singh and/or Wainright cures the deficiencies of Jons. As discussed above, the surface modification of electrokinetic channels has been an area of active research since the discovery of capillary electrophoresis. References to these methods abound in the literature as well as in Singh and Wainwright. However, claim 5 recites that the chemical properties of the polyol (allyl carbonate) polymer are modified by hydrolysis. Unlike polycarbonate and polyacrylate treated with NaOH, polyol (allyl carbonate) polymers do not loose mechanical properties upon treatment with strong bases. The big difference among these polymers, as described in the present application, lies in the chemical resistance that is inherent to polyol (allyl carbonate) polymers and is limited in polyacrylates and polycarbonates. As a result, the chemical attachment of ligands to the surface of polyol (allyl carbonate) polymers opens a large repertoire of chemical reactions that would be impossible with other polymers.

Applicant respectfully submits that the claimed device is unobvious over Jons, alone or in combination with Encyclopedia, Handbook, Singh and/or Wainright. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

The rejection of claim 5 under 35 U.S.C. § 103(a) as allegedly obvious over Webster et al. ("Batch Fabricated Electrophoresis Chips on Polycarbonate Substrates by Surface

Micromachining," J. of Capillary Electrophoresis and Microchip Technology 6 (1&2):19-25 (1999)) ("Webster"), *Modern Plastics Encyclopedia '99*, W. Kaplan (ed.), McGraw-Hill, New York, 1998, Appendix C ("Encyclopedia"), *Plastics Design Handbook*, Rosato et al., Kluwwer Academic Publishers 2001, pp. 309-334 and 400-412 ("Handbook") and Jons et al. (U.S. Patent No. 5,783,452) ("Jons") as applied to claims 1, 2, and 4, above in view of Singh et al. (U.S. Patent No. 6,627,406 B1) ("Singh") or Wainwright et al. (U.S. Patent No. 6,306,273 B1) ("Wainwright"), is respectfully traversed. Applicant respectfully submits that the claimed device is unobvious over Webster, alone or in combination with Encyclopedia, Handbook, Jons, Singh and/or Wainright.

As discussed above, all materials are endowed with certain degrees of optical, mechanical, physical, and chemical properties. However, Applicant respectfully disagrees with the assertion in the Office Action that the choice of one polycarbonate over another is just a matter of optimizing the device for the sample, buffer, and detection method. The different properties of a material dictate whether the material can be used for a given purpose or not. Rubbers have applications that they are best suited for, epoxies have different strengths and applications, thermoplastics (like polycarbonate) have their strengths, and thermoset resins have their advantages. The fact that polyol (allyl carbonate) polymers as thermoset crystalline polymers are endowed with properties especially suited for the electrokinetic devices is an unexpected and surprising result when compared to the performance of polycarbonate thermoplastics that are amorphous in nature. Polycarbonates as described by Webster are of a completely different class of polymer than polyol (allyl carbonate) polymers and the use of thermoplastics as described by Webster in no way teaches or suggests that the use of a different class of polymer will overcome the multitude of limitations presented by the use of polycarbonate thermoplastics. It is the unique properties of the polyol (allyl carbonate) polymers, as described in the present application, that allows the development of the claimed devices that do not dissolve in non-aqueous solvents, that do not melt under high applied electrical fields, and do no short under high electrical fields as would be the case with thermoplastics such as polycarbonates.

None of Encyclopedia, Handbook, Jons, Singh and/or Wainright cures the deficiciencies of Webster. As discussed above, the surface modification of electrokinetic channels has been an

area of active research since the discovery of capillary electrophoresis. References to these methods abound in the literature as well as in Singh and Wainwright. The inventive component of the present patent application lies not in the fact that chemical modification is done, but in the claim for chemical modification of polyol (allyl carbonate) polymers. Unlike polycarbonate and polyacrylate treated with NaOH, polyol (allyl carbonate) polymers do not loose mechanical properties upon treatment with strong bases. The big difference among these polymers, as described in the present application, lies in the chemical resistance that is inherent to polyol (allyl carbonate) polymers and is limited in polyacrylates and polycarbonates. As a result, the chemical attachment of ligands to the surface of polyol (allyl carbonate) polymers opens a large repertoire of chemical reactions that would be impossible with other polymers.

Applicant respectfully submits that the claimed device is unobvious over Webster, alone or in combination with Encyclopedia, Handbook, Jons, Singh and/or Wainright. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

Rejection Under 35 U.S.C. § 102

The rejection of claims 1, 2 and 4 under 35 U.S.C. § 102(b) as allegedly anticipated by Jons et al. (U.S. Patent No. 5,783,452) ("Jons") is respectfully traversed. Applicant respectfully submits that the claimed devices are novel over Jons.

As discussed above, in Jons, the construction of covered microchannels makes use of a substrate layer, an etchable layer, and a cover. Among the "grocery list" of materials listed in this patent as being suitable for the substrate layer, diglycol dialkyl carbonate is mentioned. Jons failed to identify any physical or chemical characteristic as being more or less desirable in this underlying support material; indeed, the variety of organic and inorganic materials listed in Jons is presented with complete disregard to any specific characteristic. For this reason, Jons provides substantial evidence that those skilled in the art failed to recognize the advantages provided specifically by diglycol dialkyl carbonate. Jons does not teach that specific chemical and physical properties of diglycol dialkyl carbonate or polyol (allyl carbonate) polymers would confer the ability to develop electrokinetic devices superior in performance and characteristics over thermoplastics.

Applicant respectfully submits that the claimed devices are novel over Jons. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

In light of the remarks herein, Applicant submits that the claims are now in condition for allowance and respectfully requests a notice to this effect. The Examiner is invited to call the undersigned agent if there are any questions.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 502624 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP

/Deborah L. Cadena/

Deborah L. Cadena
Registration No. 44,048

4370 La Jolla Village Drive, Suite 700
San Diego, CA 92122
Phone: 858.535.9001 DLC:llf
Facsimile: 858.597.1585
Date: February 25, 2008

Please recognize our Customer No. 41552 as our correspondence address.